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A STUDY OF THE EFFECTIVENESS OF ONTARIO'S SPORT FISH CONSUMPTION GUIDELINES. C.M. Cox\*, A.L. Vaillancourt and A.F. Johnson, Water Resources Branch, Environment Ontario, Toronto, Ontario M4V 1P5

### 1. Introduction

Since 1977, the province of Ontario, through the Sport Fish Contaminant Monitoring Program, has distributed an annually-updated advisory publication on the suitability for consumption of Ontario sport fish. The 1989 "Guide to Eating Ontario Sport Fish" presently lists size-specific consumption advice, based on contaminant levels, for sport fish from over 1600 locations across Ontario.

In conjunction with the "Guide", questionnaire surveys have been included in 1978, 1983, 1986, and 1989. These questionnaires are used to determine the use and effectiveness of the "Guide", as well as Ontario anglers' fishing and sport fish consumption patterns.

In 1989, additional surveys are being conducted specifically for Great Lakes salmon and trout anglers, as they are potentially "higher risk" consumers than the average Ontario angler (from the "Guide" surveys) who consumes a variety of fish species (mainly warm-water species such as walleye) usually from inland locations. The potentially higher levels of risk are due to the elevated organic contaminant levels in Great Lakes salmon and trout (especially PCBs and mirex in Lake Ontario species). A comparison of the consumption patterns and "Guide" usage can be made between the two groups. There is a continuing need to determine the effectiveness of the "Guide" in providing contaminant information and consumption guidelines to all anglers. As well, there may be anglers who are either ignoring the guidelines or are unaware of them, and these anglers might be consuming fish at levels which may place them at a higher risk.

### 2. Methodology

The 1989 "Guide" questionnaire was enclosed in the "Guide" books. The 1989 Great Lakes surveys are being conducted using mailing lists derived from randomly selected entry forms for various Great Lakes salmon and trout derbies. The derbies involved in these surveys are the: Toronto Star Great Salmon Hunt (Lake Ontario), Chantry Chinook Classic (Lake Huron), Owen Sound Salmon Spectacular (Georgian Bay) and Michipicoten Salmon Derby (Lake Superior).

The questions were standard for all the Great Lakes surveys, and the consumption questions were comparable to those in the 1989 "Guide" survey. Comparisons could be made between anglers consuming salmon and trout from Lake Ontario (which have the highest organic contaminant levels and therefore more consumption restrictions) and from some of the other Great Lakes (where contaminant levels were much lower and fish were most frequently

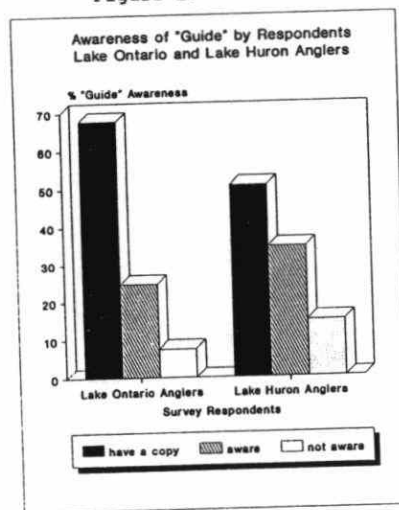
in the unlimited consumption category). Determinations could be made to see if anglers were aware of the "Guide", and if the "Guide" advice was being followed, based on the consumption patterns. If the advice was being followed, then anglers consuming Lake Ontario salmon and trout should eat less fish than both salmon and trout anglers fishing other Great Lakes, and the average Ontario angler fishing for a variety of species.

### 3. Results

The Lake Ontario and Lake Huron surveys have been completed, while, because of their late summer derby dates, the Georgian Bay and Lake Superior surveys have not yet been completed. As well, the 1989 "Guide" surveys are still being received, but over 800 responses have been used in the calculation of this survey's results.

Based on the Lake Ontario and Lake Huron surveys, there is a high awareness and usage of the "Guide" among anglers (see Figure 1).

Figure 1.



The question was asked if anglers who used the "Guide" followed the consumption guidelines, and 81% and 71% respectively of the Lake Ontario and Lake Huron anglers indicated that they did follow the guidelines. The guidelines for consuming fish with restrictions due to organic contaminants is a meal every two weeks

for the long-term consumer (except for women of childbearing age and children under 15, who should not consume these fish at all). The frequency of consumption can be used as an indication of adherence to the "Guide" consumption guidelines. For Lake Ontario, where most of the salmon and trout are restricted, only 11.1% of the respondents consumed fish at a frequency greater than once every two weeks. For Lake Huron, where the salmon and trout are generally not restricted, 26.7% consumed these fish more frequently than once every two weeks, while for the "Guide" anglers, 18.0% consumed sport fish more frequently than this frequency.

The average daily sport fish consumption, which was derived from the meal size and meal frequency, was found to be the lowest for Lake Ontario anglers and the highest for Lake Huron anglers (see Figure 2). Figure 3 shows a comparison of the meal sizes consumed by "Guide", Lake Ontario and Lake Huron anglers. While the majority of anglers in all three surveys are consuming sport fish in meal sizes of 227 gm (8 oz) or less, there are fewer Lake Ontario respondents than other respondents consuming sport fish meals above 227 gm. As well, more than twice as many Lake Ontario anglers do not consume their catch (often because of an indicated concern about the contaminant levels).

Figure 2.

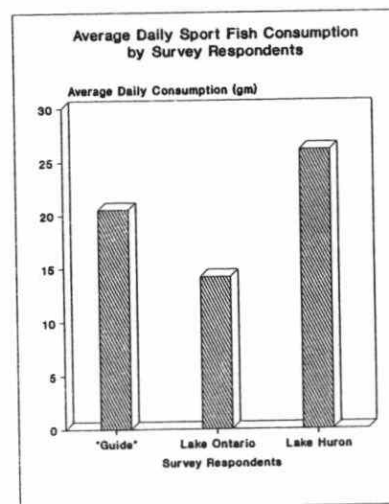
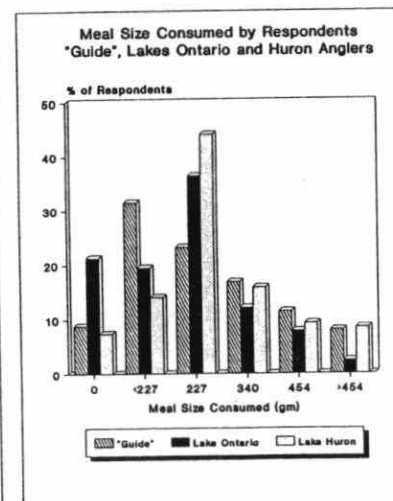


Figure 3.



As well, for the Great Lakes surveys, anglers were asked if they would keep a lake trout for consumption. Since lake trout

normally have the highest organic contaminant levels found in the edible portion of salmon and trout, they are therefore most likely to be in the restricted consumption category. Lake Ontario anglers would be aware of this through the "Guide" information, and only 13.9% of the respondents indicated that they would keep a lake trout. In contrast, 94.4% of the Lake Huron anglers indicated that they would consume lake trout, as Lake Huron lake trout have much lower contaminant levels, and are frequently not restricted for consumption. Again, this would indicate an observance of the information in the "Guide".

#### 4. Conclusions

1. The "Guide to Eating Ontario Sport Fish" is an effective means of conveying sport fish consumption advice to anglers.
2. The majority of anglers surveyed not only were aware of the "Guide", but had a copy.
3. The majority of anglers using the "Guide" were following the consumption guidelines.
4. Comparisons of consumption patterns through various surveys indicated that when consumption advice is more restrictive (eg. for Lake Ontario salmon and trout), anglers are consuming less fish. Conversely, when the guidelines indicate no consumption restrictions, anglers are consuming more fish.

#### 5. Recommendation

Follow up medical studies could be done using surveys such as this, to focus on heavy fish consumers (eg. Lake Ontario salmon and trout anglers consuming fish much more frequently than the guidelines suggest), although few respondents were found in this category. Blood or hair samples may be used to determine if elevated levels of organic contaminants or mercury (in the case of anglers consuming large amounts of larger predator fish such as walleye, which may have high mercury levels) are detected.



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